Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1–30 (cancelled)

31. (previously presented) A method of reducing oxygen demand in a water system comprising:

providing a low oxygen demand liquid to a hydroxyl free radical generator;

irradiating the low oxygen demand liquid with actinic radiation to generate hydroxyl free radicals; and

adding the low oxygen demand liquid comprising the hydroxyl free radicals to the water system,

wherein the low oxygen demand liquid is not water from the water system.

32. (previously presented) The method of claim 31, wherein the free radical generator comprises a channel disposed to flow the low oxygen demand liquid therethrough during irradiation with actinic radiation.

33. (previously presented) The method of claim 32, wherein a surface of the channel is reflective to actinic radiation.

34. (previously presented) The method of claim 32, wherein a wall of the channel comprises a coating capable of catalytically promoting free radical production.

35. (previously presented) The method of claim 33, wherein the coating comprises titanium dioxide.

36. (previously presented) The method of claim 32, wherein a wall of the channel comprises any of stainless steel, titanium or alloys thereof.

37. (previously presented) The method of claim 31, further comprising adding a hydroxyl free radical donor to the low oxygen demand liquid.

38. (previously presented) The method of claim 37 wherein the hydroxyl free radical donor comprises at least one of hydrogen peroxide, ozone, oxygen, and a peroxygen compound.

39. (previously presented) The method of claim 38, wherein the low oxygen demand liquid has at least about 0.1 % active $H_2O_2$.

40. (previously presented) The method of claim 31, further comprising lowering a pH of the low oxygen demand liquid to less than about 9.

41. (previously presented) A method of reducing oxygen demand in a water system comprising:

providing a low oxygen demand liquid, not from the water system, to a hydroxyl free radical generator;

generating hydroxyl free radicals in the low oxygen demand liquid; and

adding the low oxygen demand liquid comprising the hydroxyl free radicals to the water system.

42. (previously presented) The method of claim 41, further comprising adding a hydroxyl free radical donor to the low oxygen demand liquid.

43. (previously presented) The method of claim 42, wherein the hydroxyl free radical donor comprises at least one of hydrogen peroxide, ozone, oxygen, and a peroxygen compound.

44. (previously presented) The method of claim 43, wherein the low oxygen demand liquid has at least about 0.1 % active $H_2O_2$.

45. (previously presented) The method of claim 41, further comprising lowering a pH of the low oxygen demand liquid to less than about 9.

46. (previously presented) The method of claim 41, wherein the free radical generator comprises at least one channel disposed to flow the low oxygen demand liquid therethrough, the channel comprising a metal selected from the group consisting of titanium and titanium alloy.

47. (previously presented) The method of claim 46, wherein a surface of the channel comprises a coating capable of catalytically promoting free radical production in the low oxygen demand liquid.

48. (previously presented) The method of claim 47, wherein the coating comprises titanium dioxide.

49. (cancelled)

50. (cancelled)

51. (cancelled)

52. (cancelled)